BUREAU OF ENVIRONMENTAL REMEDIATION/REMEDIAL SECTION POLICY

Consideration and Selection of Borrow Sites

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SUBJECT: Consideration and Selection of Borrow Sites.

PURPOSE: This guidance was developed to clarify the minimum requirements for contractors in proposing and selecting areas to obtain clean soil and/or fill. These areas are commonly referred to as "borrow sites."

GUIDANCE - In the planning of construction operations where materials will be brought in to backfill, cover, or restore a contaminated site, it is vital to evaluate the conditions and suitability of the borrow material. Low permeability may be the key parameter for material intended for capping of a waste repository, while permeable materials, such as sand and gravel, may be suitable for backfill in a product collection trench. During the backfilling of excavations, an effort should be made to match the permeability of the native soil column to prevent creation of an infiltration conduit into the subsurface and, conversely, to prevent pooling and compaction that might impede vegetative growth. The type of information necessary to evaluate potential borrow areas includes not only the location, extent, and condition of the soil layers but also the elevation of the groundwater table and bedrock; the drainage characteristics of the surface and subsurface soils; and the location of possible borrow areas from which soil and other mineral-product (i.e., limestone, gravel, etc.) materials may be "borrowed" for a remediation/construction operation. The nature of the information necessary to support the selection of a borrow site varies with the intended use of the borrowed material, e.g., whether it will be used for impermeable cover, a permeable drainage layer, or to bring an excavation site back up to grade. Evaluation of the potential borrow area may be required to obtain this information. KDHE concurrence should be obtained well in advance on the level of evaluation effort that will go into selecting a borrow site and the reporting required to document the quality or the physical characteristics of the borrow material.

Evaluation activities may include:

- Research to identify historical uses and activities at the proposed borrow site that could potentially have contaminated or impacted the borrow material.

- Sampling for chemical analysis to confirm the borrow material is uncontaminated. Soil samples collected for chemical analysis must provide adequate lateral and vertical coverage of the proposed borrow area as proposed by the consultant/engineer for KDHE project manager approval. The samples should be collected and analyzed for all site contaminants of concern (COCs), as well as other potential environmental contaminants determined from the review of historical uses and activities at the borrow site, as determined in consultation with the KDHE project manager.

- Classification of surface and subsurface soils using the methods outlined in the Unified Soil Classification System as outlined in ASTM 2488. Classification of soil must be

completed by a licensed geologist or soil scientist and must be submitted to KDHE as part of the borrow area description.

- Sampling for geotechnical analysis (laboratory and/or field analysis) of all soil horizons proposed as borrow source material. Geotechnical analyses may include a number of physical parameters such as particle size distribution, Atterberg limits, permeability, compaction, plasticity index, etc. These parameters should be proposed by the consultant/engineer for KDHE project manager approval to support the selected design of the remedial alternative. Either compositing of aliquots from individual horizons or vertical compositing to average the characteristics of the individual layers may be more appropriate where multiple soil horizons are to be employed as borrow material, depending on the intended use and project goals. Commercial suppliers of aggregate and other materials may certify the geotechnical characteristics of their products.

- Agronomic testing to evaluate the ability of the borrow material to sustain permanent vegetative growth and whether the incorporation of soil amendments is necessary to promote that growth.

COLLECTION METHODS:

The collection of soil samples in the field for testing may include three principal methods of sampling: 1) collection of soil samples from the surface, 2) collection of soil samples from open excavations, and 3) collection of soil samples from test pits and test holes. The extent and methods used will be dependent upon the time and resources available, and the extent of the information needed. Collecting samples from test pits often provides the most satisfactory results for both studying the natural soil conditions and for collecting undisturbed soil samples.

OTHER REQUIREMENTS - The consultant will be expected to document that the proposed borrow site does not incorporate or impact the following areas:

- **High conservation value areas** such as wetlands, floodplains or riparian areas. The landowner is required by law to conserve native vegetation, including grasslands (as in the Native Vegetation Conservation Act 1997);
- Areas containing any **habitats for threatened flora and fauna** species, as covered by the Threatened Species Conservation (TSC) Act 1995; and
- Areas containing any protected **heritage and archaeological sites.**

In addition, the consultant is responsible for contacting the KDHE/Bureau of Water to determine if a storm water construction permit will be required for the proposed project for the borrow site. Documentation (telephone conversation record) should be included in the proposal.

The consultant should not propose unsuitable soil types for borrow material, such as:

- **Sodic soils** that have an excess of exchangeable sodium causing undesirable physical changes to occur in clay;
- **Acid sulfate soils** that may create acidic conditions resulting in undesirable leaching of metals, corrosion of steel and concrete, and may not support vegetation; or

- **Sand or permeable soils** that may allow infiltration of polluted surface water into an underlying water-bearing zone, unless that permeability is a desirable characteristic for the proposed cleanup design.

The KDHE project manager must approve any deviations to the use of unsuitable soil types. There may be areas in Kansas where more suitable soil is not readily available.

Finally, the consultant must identify the future use of the borrow area and describe how the area will be restored following excavation activities (i.e., proper slope, vegetation, pond, etc.)